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# FAX

U.S. Department of Transportation

**Research and Special Programs Administration**

John A. Volpe National Transportation Systems Center

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Paul,

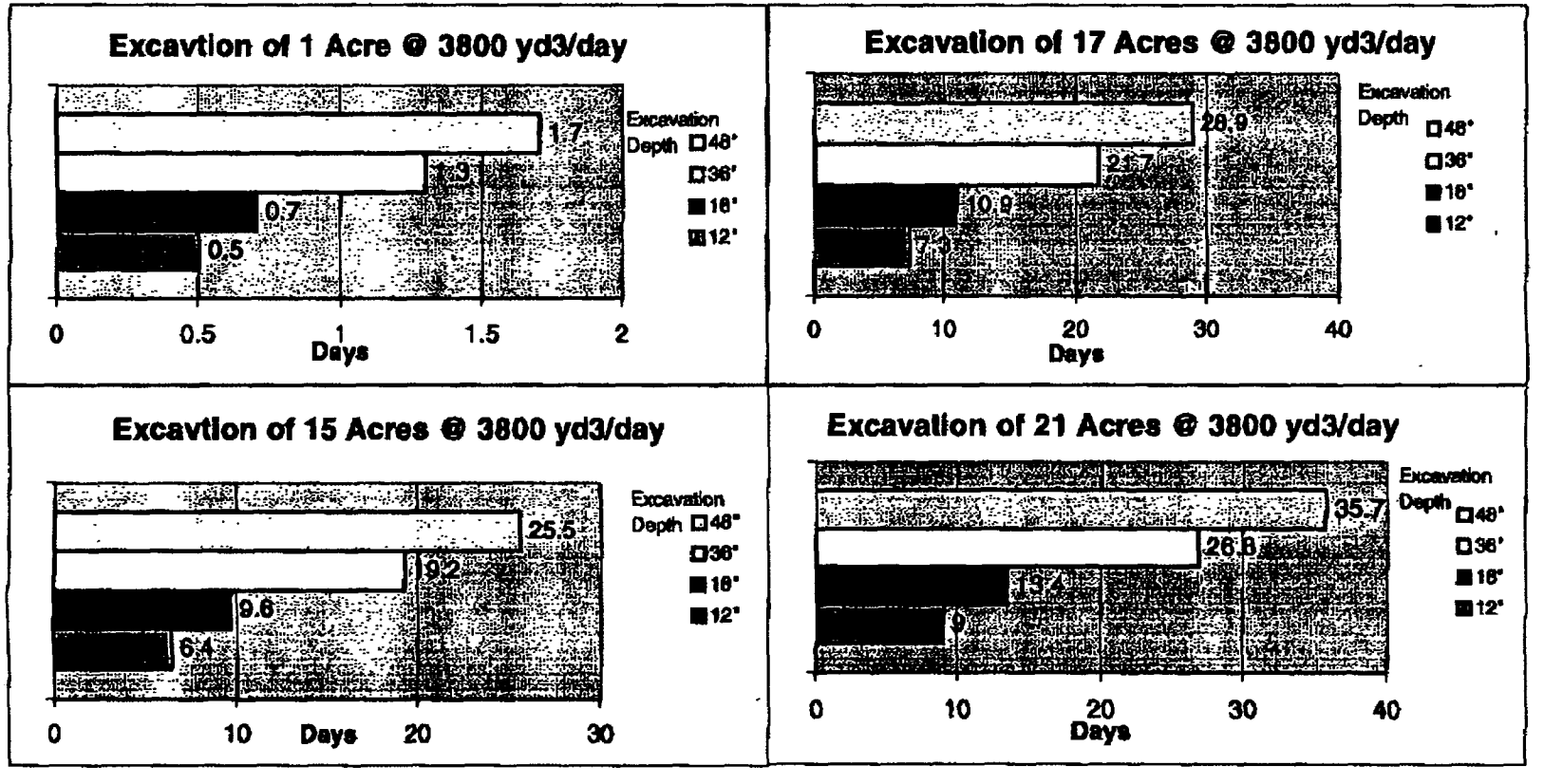
Here are some projected schedules for soil excavation. Please note that there will be a larger bucket installed on one of the excavators and possibly an additional excavator mobilized with more articulated trucks that will ultimately increase the yd3/day and thus decrease the number of days. In addition, the soil quantities are being verified by current daily outputs.

I will update this to reflect the new quantities when I receive the information.

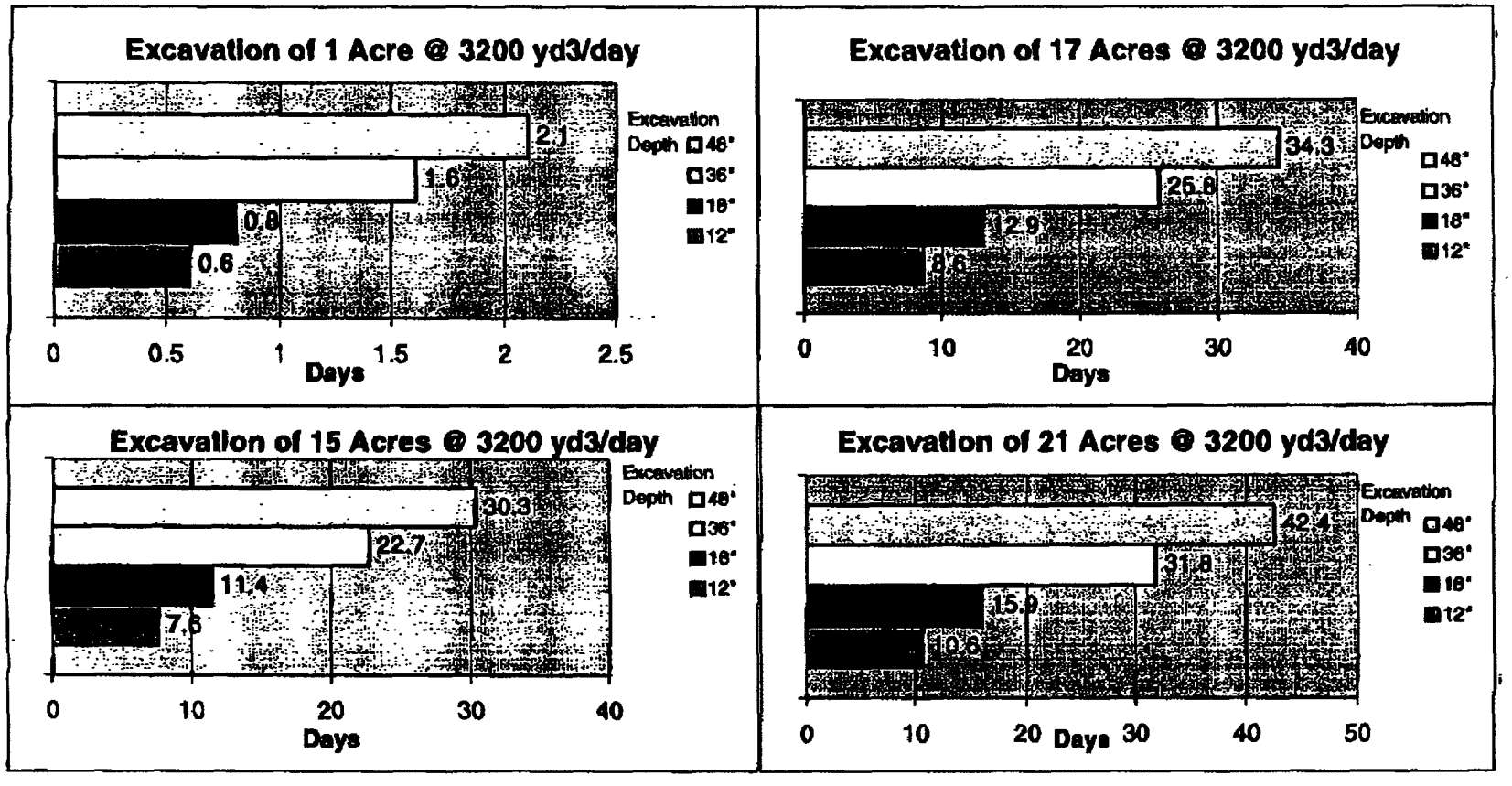
If you have any questions, just give a call.

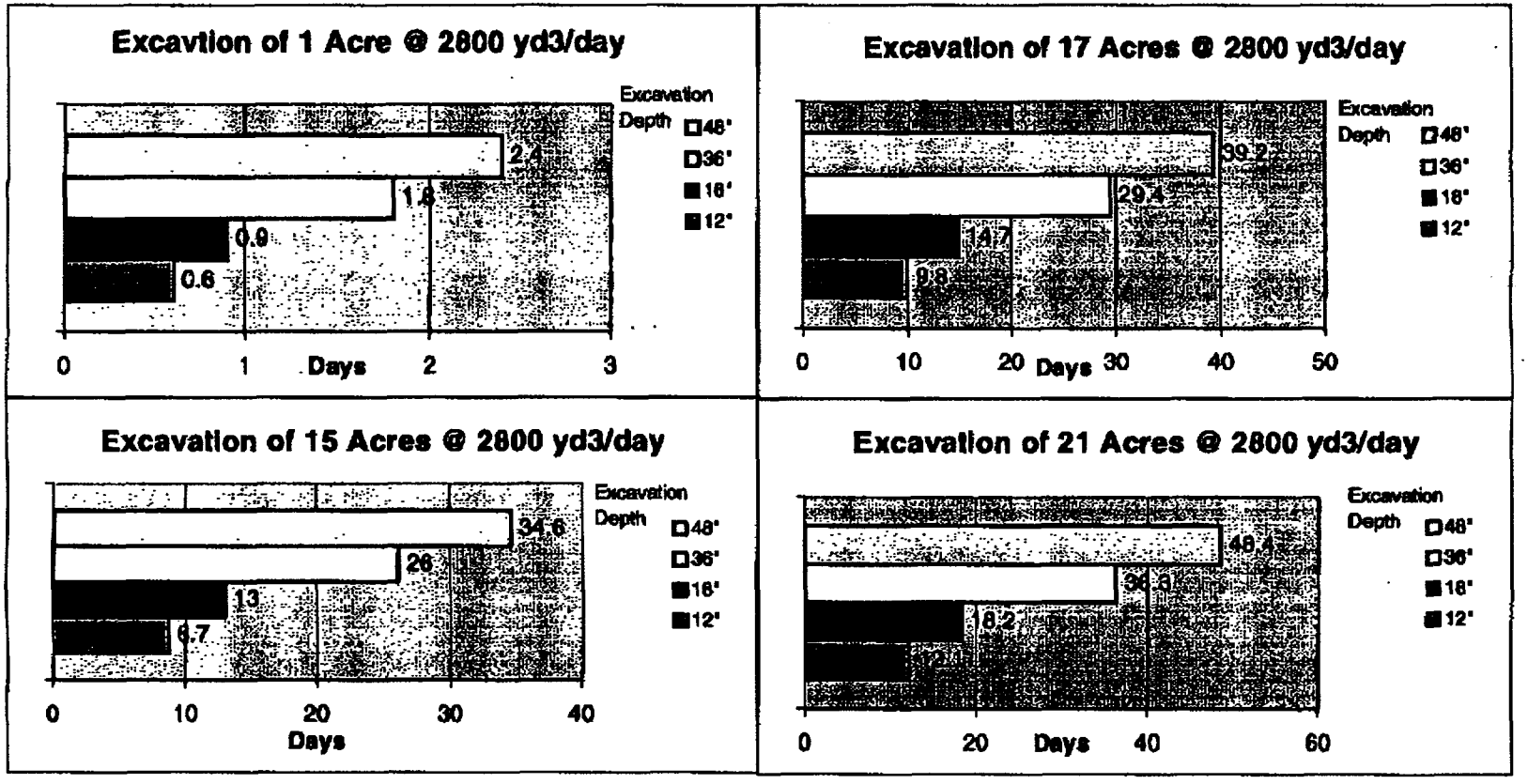
Regards,
Kuda

Excavation @ 3800 yd3/day

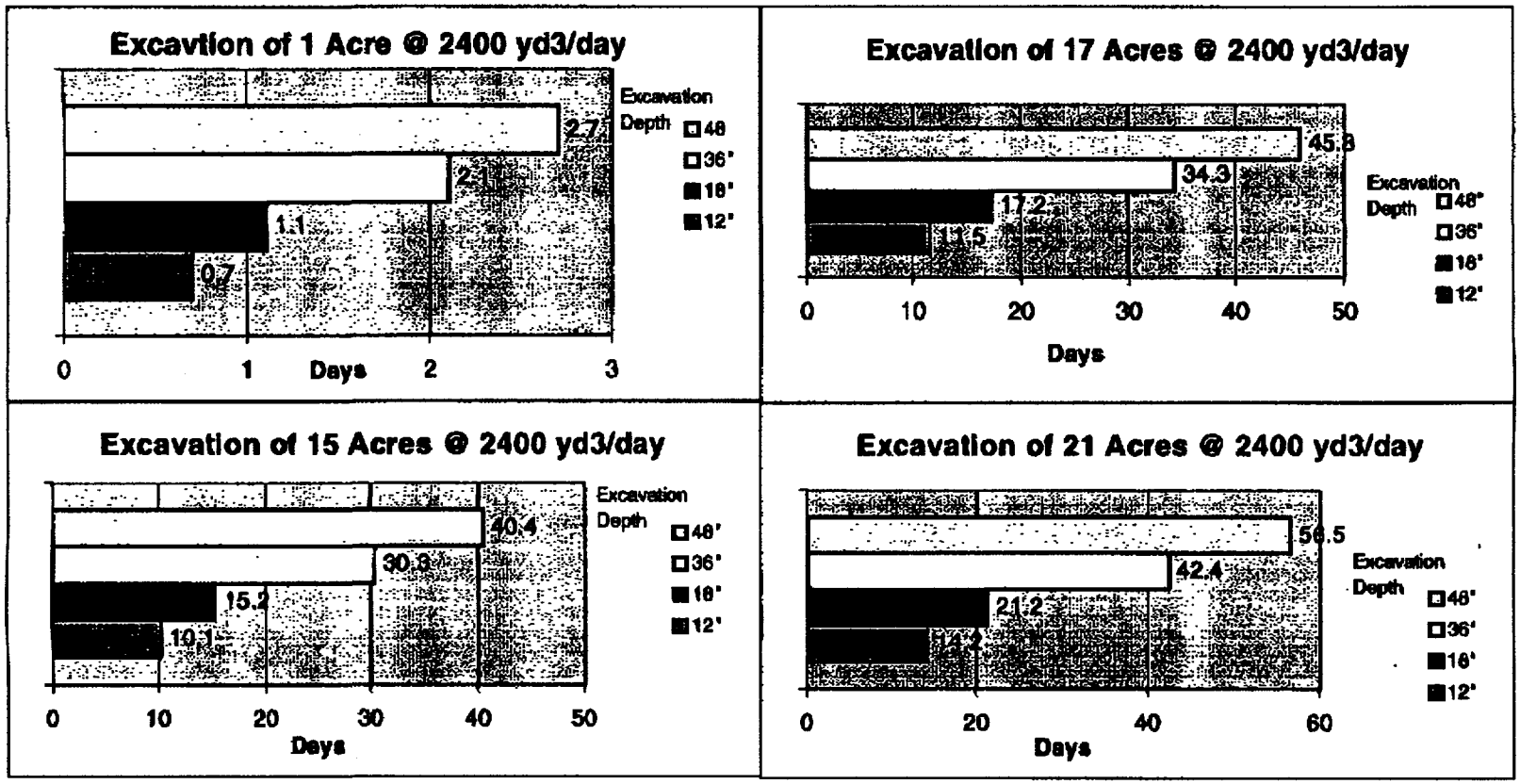


# Excavation @ 3200 yd3/day

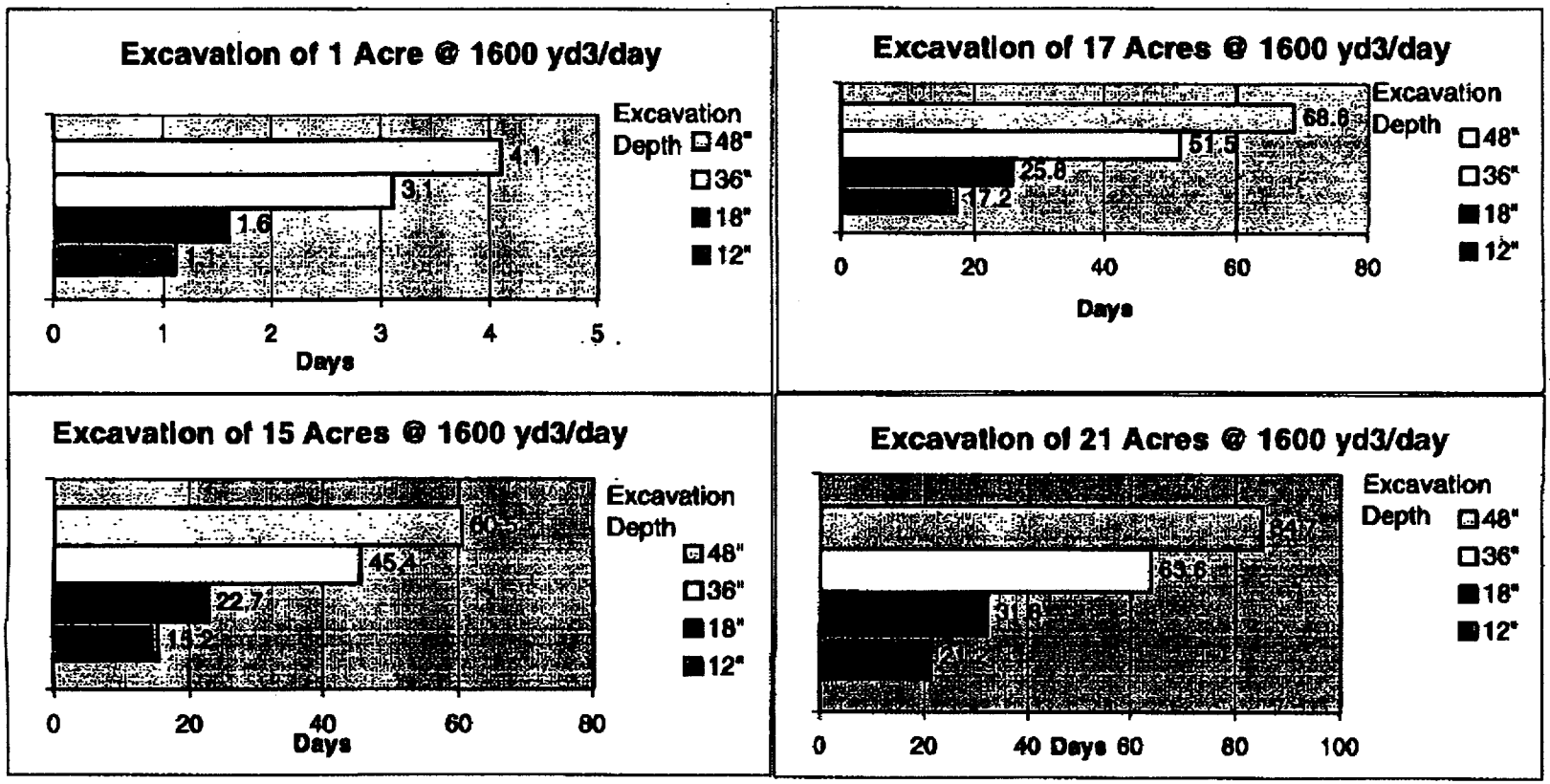



Excavtion of 1 Acre @ 2800 yd3/day
Excavation Depth
48"
36"
16"
12"
2.4
1.8
0.9
0.6
0
1
Days
2
3
Excavation of 17 Acres @ 2800 yd3/day
Excavation Depth
48"
36"
16"
12"
39.2
29.4
14.7
9.8
0
10
20
Days
30
40
50
Excavation of 15 Acres @ 2800 yd3/day
Excavation Depth
48"
36"
16"
12"
34.6
26
13
6.7
0
10
20
30
40
Days
Excavation of 21 Acres @ 2800 yd3/day
Excavation Depth
48"
36"
16"
12"
49.4
8.2
0
20
Days
40
60

# Excavation @ 2400 yd3/day

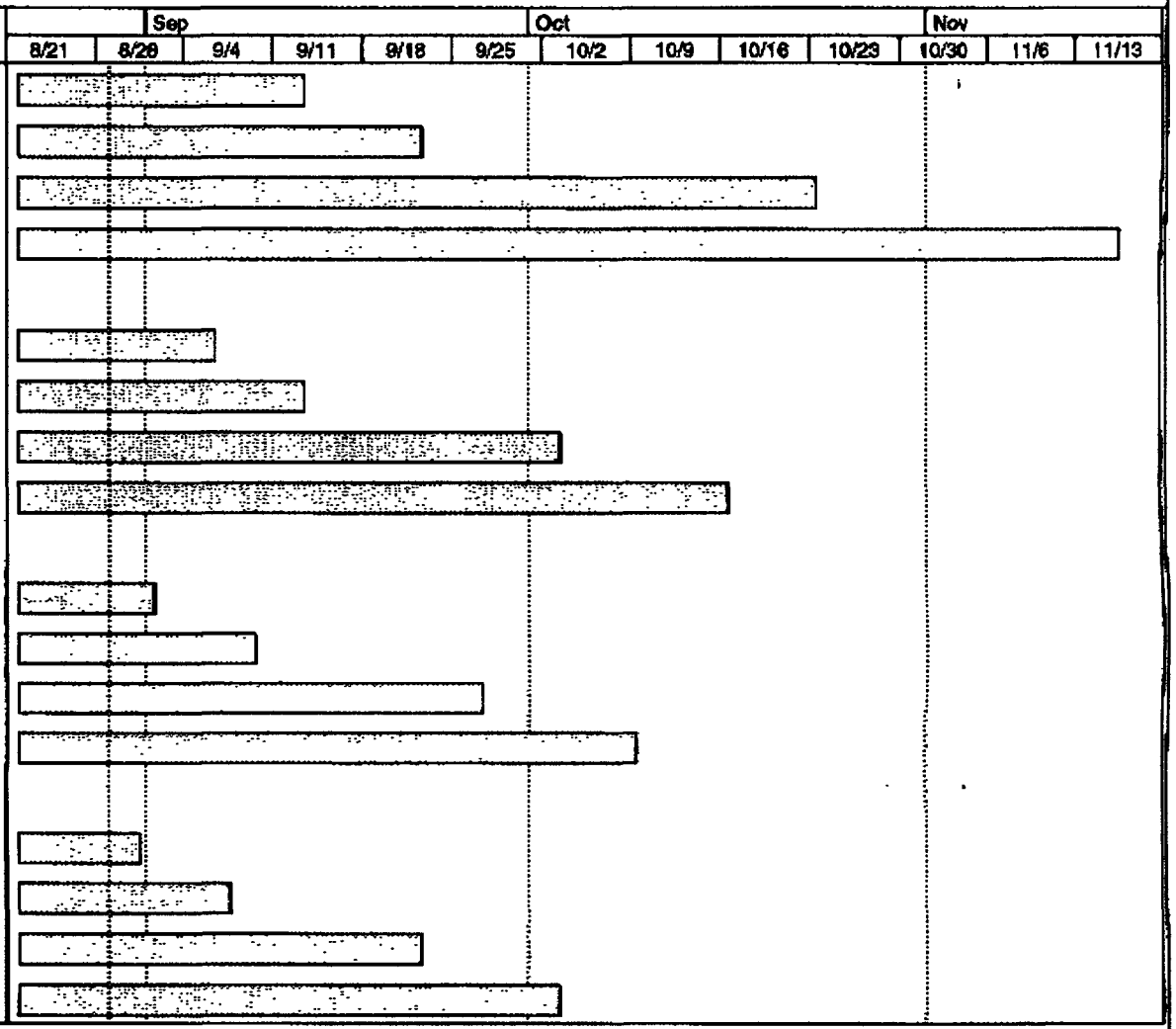


# Excavation @ 1600 yd3/day



# Soil Excavation - Projected Schedules

| ID | Task Name | Duration |
|---|---|---|
| 1 | 12' Soil Excavation of 17 Acres @ 1600 yd3/day | 17.2 days |
| 2 | 18' Soil Excavation of 17 Acres @ 1600 yd3/day | 25.8 days |
| 3 | 36' Soil Excavation of 17 Acres @ 1600 yd3/day | 51.5 days |
| 4 | 48' Soil Excavation of 17 Acres @ 1600 yd3/day | 68.6 days |
| 5 | | |
| 6 | 12' Soil Excavation of 17 Acres @ 2400 yd3/day | 11.5 days |
| 7 | 18' Soil Excavation of 17 Acres @ 2400 yd3/day | 17.2 days |
| 8 | 36' Soil Excavation of 17 Acres @ 2400 yd3/day | 34.3 days |
| 9 | 48' Soil Excavation of 17 Acres @ 2400 yd3/day | 45.8 days |
| 10 | | |
| 11 | 12' Soil Excavation of 17 Acres @ 2800 yd3/day | 9.8 days |
| 12 | 18' Soil Excavation of 17 Acres @ 2800 yd3/day | 14.7 days |
| 13 | 36' Soil Excavation of 17 Acres @ 2800 yd3/day | 29.4 days |
| 14 | 48' Soil Excavation of 17 Acres @ 2800 yd3/day | 39.2 days |
| 15 | | |
| 16 | 12' Soil Excavation of 17 Acres @ 3200 yd3/day | 8.6 days |
| 17 | 18' Soil Excavation of 17 Acres @ 3200 yd3/day | 12.9 days |
| 18 | 36' Soil Excavation of 17 Acres @ 3200 yd3/day | 25.8 days |
| 19 | 48' Soil Excavation of 17 Acres @ 3200 yd3/day | 34.3 days |




Project: Soil Projection
Date: Tue 8/29/00

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary



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## Calculations

Excavator = 355 scoops/day
Truck = 32 trips/day

| | | | |
|---|---|---|---|
| 2 Excavators | 355 scoops/day | 2 Trucks | 32 trips/day |
| 6.75 $yd^3$ | ~2400 $yd^3$/day | 48 $yd^3$ | ~1540 $yd^3$/day |

(1 Acre)*(43,560 $ft^2$/acre)*(1 ft) = 43,560 $ft^3$
(43,560 $ft^3$)/27 = 1613 $yd^3$

(17 Acre)*(43,560 $ft^2$/acre)*(4 ft) = 2,962,080 $ft^3$
(2,962,080 $ft^3$)/27 = 109,707 $yd^3$

(109,707 $yd^3$)/(2400 $yd^3$/day) = 45.8 days

Projections for Soil Excavation

8/29/00

| | | | |
|---|---|---|---|
| 1 Excavator 4.5 $yd^3$ | 355 scoops/day ~1600 $yd^3$/day | 1 Truck 24 $yd^3$ | 32 trips/day ~770 $yd^3$/day |

| | | | |
|---|---|---|---|
| 2 Excavators 6.75 $yd^3$ | 355 scoops/day ~2400 $yd^3$/day | 2 Trucks 48 $yd^3$ | 32 trips/day ~1540 $yd^3$/day |

(Excavator 1: 4.5 $yd^3$ bucket; Excavator 2: 2.25 $yd^3$ bucket)

Using excavators onsite (6.75 yd3), needed will be at least 1 more 24 yd3 truck to haul soil to the long shed to meet the capabilities of the 2 excavators

Having a third truck will allow the 46 day schedule to be met.

Utilizing AutoDesk Software and information learned from the Test Pits, a more accurate estimate on the total volume of soil that will be excavated, will be developed. There is also a "fluff" factor involved. The soil being removed is compacted. The soil being stockpiled and trucked has more volume (fluff). This also has to be considered.

| | | | ~1600 $yd^3$/day No. of Days | ~2400 $yd^3$/day No. of Days | ~2800 $yd^3$/day No. of Days | ~3200 $yd^3$/day No. of Days | ~3800 $yd^3$/day No. of Days | ~4200 $yd^3$/day No. of Days |
|---|---|---|---|---|---|---|---|---|
| 1 Acre | @ 12" = | 1,613 $yd^3$ | 1.1 | 0.7 | 0.6 | 0.6 | 0.5 | 0.4 |
| | @ 18" = | 2,420 $yd^3$ | 1.6 | 1.1 | 0.9 | 0.8 | 0.7 | 0.6 |
| | @ 36" = | 4,840 $yd^3$ | 3.1 | 2.1 | 1.8 | 1.6 | 1.3 | 1.2 |
| | @ 48" = | 6,453 $yd^3$ | 4.1 | 2.7 | 2.4 | 2.1 | 1.7 | 1.6 |
| 15 Acres | @ 12" = | 24,195 $yd^3$ | 15.2 | 10.1 | 8.7 | 7.6 | 6.4 | 5.8 |
| | @ 18" = | 36,300 $yd^3$ | 22.7 | 15.2 | 13 | 11.4 | 9.6 | 8.7 |
| | @ 36" = | 72,600 $yd^3$ | 45.4 | 30.3 | 26 | 22.7 | 19.2 | 17.3 |
| | @ 48" = | 96,795 $yd^3$ | 60.5 | 40.4 | 34.6 | 30.3 | 25.5 | 23.1 |
| 17 Acres | @ 12" = | 27,421 $yd^3$ | 17.2 | 11.5 | 9.8 | 8.6 | 7.3 | 6.6 |
| | @ 18" = | 41,140 $yd^3$ | 25.8 | 17.2 | 14.7 | 12.9 | 10.9 | 9.8 |
| | @ 36" = | 82,280 $yd^3$ | 51.5 | 34.3 | 29.4 | 25.8 | 21.7 | 19.6 |
| | @ 48" = | 109,707 $yd^3$ | 68.6 | 45.8 | 39.2 | 34.3 | 28.9 | 26.2 |
| 21 Acres | @ 12" = | 33,873 $yd^3$ | 21.2 | 14.2 | 12.1 | 10.6 | 9 | 8.1 |
| | @ 18" = | 50,820 $yd^3$ | 31.8 | 21.2 | 18.2 | 15.9 | 13.4 | 12.1 |
| | @ 36" = | 101,640 $yd^3$ | 63.6 | 42.4 | 36.3 | 31.8 | 26.8 | 24.2 |
| | @ 48" = | 135,513 $yd^3$ | 84.7 | 56.5 | 48.4 | 42.4 | 35.7 | 32.3 |